

result in an unexpected increase in flame resistance and, as such, do not establish a prima-facie case of obviousness.

The Examiner contends (see page 5 of the June 4, 2007, Office Action) that a comparison between Example 1 and Comparative Example 2, in the applicant's current specification does not illustrate an "unexpected increase in flame resistance."

Specifically, the Examiner contends that modifying Ichibori et al. as taught by Mori et al. would result in one of three events:

- a) a fabric with better flame resistance
- b) a fabric with worse flame resistance
- c) a fabric with the same flame resistance

Therefore, according to the Examiner, the occurrence of one of the three events is not unexpected but, rather, the occurrence of one of the three events is expected. Thus, according to the Examiner, the applicants have failed to show, or attempt to show, that specific occurrence of an event (a) is unexpected or that the occurrence of the event (a) is unexpected to a level sufficient to rebut prima facie obviousness.

However, applicants submit that evidence and logic shown to be of record in the prior art proves the contrary to be the case. In that regard, it is well known that cellulosic fiber, such as cotton, does not melt under an elevated temperature. Rather, it burns and leaves a char. In contrast, a synthetic fiber formed from a thermoplastic resin such as polyester and polyamide (thermoplastic fiber) melts under elevated temperature.

It may be known that a thermoplastic fiber is less flammable than a cellulosic fiber. However, it is well known that fiber blends such as cotton/polyester or cotton/polyamide are more flammable than cotton, polyester or polyamide alone due to what is called "scaffolding effect". In this regard, the "scaffolding effect" phenomenon is discussed in each of the four listed documents which are attached:

1. Eui So Lee, Journal of Applied polymer science, Vol. 84, 172-177 (2002). (see page 172 left side column, 1st to 5th sentences)
2. <http://www.rcw.raifoundation.org/fashion/BAfashion-mktg/textilemanufacturingtechniques/lecture-notes/lecture-17.pdf>. (see page 69 left side column line 2 from the bottom to right side column line 8)

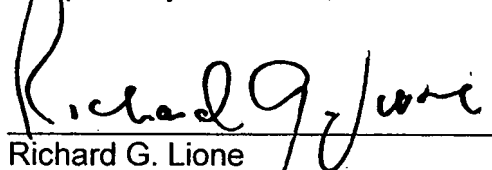
3. Hui Yang and Charles Q. Yang, Polymer Degradation and Stability 88 (2005) 363-370. (see page 364 left side column lines 3-6)
4. M.S.Subbulakshmi et al. Reviews Macromol. Chem. Phys., 40(1) 85-104 (2000). See page 87 last paragraph to page 88 lines 13.

Based on the foregoing evidence, applicants submit that those of ordinary skill would expect that fiber blends of a cellulosic fiber and a thermoplastic fiber would be more flammable than each fiber alone, due to the "scaffolding effect" described above. To the contrary, however, the fabric of Example 1 of the present specification that comprises cotton and nylon is more flame resistant than the fabric of Comparative Example 2 that comprises cotton and not nylon as discussed in the last response. Accordingly, the occurrence of event (a) is clearly unexpected.

The Examiner also alleges that the U.S. Patent No. 5,587,118 to Mallonee discloses that nylon 6 and nylon 66 are flame retardant (column 2, lines 24-30). Therefore, it would be expected that the addition of nylon 6 or nylon 66, as taught by Mori et al., would increase the flame resistance of the fabric. However, the M.S. Subbulakshmi et al. publication described above discloses that nylon has self-extinguishing properties. In other words, nylon is believed to be flame retardant. In spite of this description, the Subbulakshmi et al. publication discloses that nylon burns vigorously when blended with cellulose fiber due to a "scaffolding effect". Accordingly, the occurrence of the event (a) would be unexpected even when referring to U.S. Patent No. 5,587,118 to Mallonee.

The bottom line is that all evidence and logic support the proposition that the applicants improvements (claimed) were unexpected, and not obvious. Accordingly, applicants submit that Claims 1-3 should be allowed.

Respectfully submitted,



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Client/Matter No. 5404/91

Enclosed:
Attachments 1-4

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